Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of:	)	
	)	
The Amendment of Part 97 of the Commission's Rules and Regulations to Permit Greater Flexibility in Digital Data Communications	)	**RM-11708**
	)	**WT-16-239**
	)	
The Amendment of Part 97 of the Commission's Amateur Radio Service Rules to Reduce Interference and Add Transparency to Digital Data Communications	)	**RM-11831**
	)	
By: W. Lee McVey, PE Ret.	)	
	)	
To: The Chief, Wireless Telecommunications Bureau	)	
	)	

EX PARTE REPLY TO THE COMMENTS OF ARRL DATED SEPTEMBER 17, 2019 and ADDENDUM TO COMMENTS

1. Introduction

I respectfully request that the Commission accept my Ex Parte Reply to the further Comments of the American Radio Relay League (ARRL) in the above captioned Proceedings, styled mainly as an Addendum to my earlier Comments. Filing at this point is made necessary in order to address the misleading and incorrect conclusions discussed in Section III. D. of ARRL Comments filed Ex Parte dated September 17, 2019. The conclusions and rationale in that Section with respect to compressed and encrypted content run well beyond those covering the same subject material from the ARRL Board

of Directors Meeting of July 19-20, 2019.[1] The Minutes can be found here: http://www.arrl.org/files/file/2019%20Board%20of%20Directors/Final%20Minutes%20July%202019.pdf

The decision directed the ARRL counsel to only present its opposition to encryption, Point 5, and that Mr. Siddall request the commission to caution amateurs about use of methods that may result in encrypted or obscured content, Point 6. Instead, his submittal goes well beyond what he was directed to do in Agenda Item 31., as approved by Board Motion, and proceeded to defend use of compressed digital methods, largely employed by the Amateur Radio Safety Foundation Inc., (ARSFI/Winlink) but offers no evidence to refute claims by others, including myself, that *such methods do, in fact, result in intentionally obscured or effectively encrypted content*.[2] Among other things, simply saying that "it is or has been common practice," is a hollow, baseless argument and offers no evidence to defend the practice. Especially any demonstrating that it is lawful and in accordance with 47CFR§97, et. seq., the Amateur Radio Service rules and regulations.

2. Background

I am a retired electrical engineer. Amateur radio led me to my career path. I obtained my FCC First Class Radiotelephone license in 1965, and my first amateur license as a younger teenager in 1961. I am a Life Senior Member of the Institute of Electrical and Electronic Engineers and a retired Professional Engineer in five states. My interest in filing yet more commentary is to attempt to clarify some rather vague and misleading points in the ARRL's latest submittal.

I sent to each of the ARRL Board members the attached email letters on September 1 and September 9, 2019. They are included as an Appendix to this filing. In them, I

[1] ARRL Board Minutes, Agenda Item 31, Points 5 and 6, p. 17.
[2] ARRL WT-16-239 and RM-11708 Ex Parte Comments Filed September 17, 2019. Section III.D., p. 11

attempted to both caution the Board on relying on what I would term 'propaganda' defending the use of data compression in digital bit streams as something benign, of little concern, and therefore within current FCC and ITU regulations. The practice clearly is not benign, since obscurity is a widely known and desired side-benefit. And, from the tenor of their filing, ARRL chose to ignore what I said in more depth about one of those techniques: Huffman compression. More to the point, how it has been adapted and applied to amateur radio forwarded email message content by ARSFI/Winlink. Specifically, how Huffman *effectively obscures* message content to anyone attempting to monitor as a 3rd party listener without totally perfect copy of content streams. *Its encoding methodology creates situations where transmitted content does not comply with 47CFR§97.309(a) as presently defined for Specified digital codes.*

3. Compression or Encryption. Which is it?

Both compression methods and encryption rely on translation techniques to convolute bit stream content from simple, standard character sets into something else. Different objectives, seemingly, on the surface, but "look under the hood," and there are a lot of similarities. 47CFR§97.309(a), et. seq., defines what standard code formats must be used in order to be allowed on the high frequency (HF) Amateur Service bands. As they are now codified, it has to be one of them: either ASCII, Baudot or AMTOR. Each of these have defined, widely accepted code tables for translating characters into digital words of 5 or 7 bits in size for each character, symbol or punctuation. Compression, on the other hand, analyzes groups of text and uses a variety of methods to modify part of character sets to form what I will term as new Translation Tables (TT). Encryption, on the other hand, uses a methodology to modify the transmitted character set such that it changes according to a pattern. The simplest encryption method being a shift in

position of characters (called a Caesar Cipher in honor of its creator, Julius Caesar)[3]. There are many others, including keywords to adjust character position in TTs.[4] In both encryption and compression, the TT, based upon standardized and published character sets, is modified. In every case, the modification methods must be known head of time or discovered after considerable effort to reconstruct original content. *Both are obscure in transmitted form*, either as the most desired outcome (encryption); or incidentally, as a product of the process (compression).

4. Why Compression?

Compression was developed to shorten the amount of transmitted digital data and, as a result, data transmission time. It isn't new. Samuel F.B. Morse took a stab at it when he developed the TT for CW: what we use in the Amateur Service today.[5] Compression has been widely used in other regulated services, since many value the amount of time that their infrastructure is used to transmit and forward data. Time is money, obviously. We live in a very competitive telecommunications world. There are many types of compression. Some are based on fixed TT methods, whereas others, such as Huffman compression, use methods to count the frequency of use of ASCII or Baudot characters and develop new a new and unique TT for each and every new message body. One that must be decompressed, using a new set of character definitions for each new message. Taking something widely known, standardized and accepted and converting it into a hodge-podge of unique symbols to attempt efficiency improvement. With native ASCII, Baudot, and the Morse Code: *Everyone knows what they are, and everyone has them before hand to decipher transmitted content back into text. Everyone can intercept and accurately monitor, propagation permitting. And, a skipped few letters, words or*

[3] http://practicalcryptography.com/ciphers/caesar-cipher/
[4] See Vigenere Cipher https://pages.mtu.edu/~shene/NSF-4/Tutorial/VIG/Vig-Base.html
[5] https://www.johndcook.com/blog/2017/02/08/how-efficient-is-morse-code/

frames won't compromise the legibility of the rest of the content.

The Huffman method, as applied by ARSFI/Winlink, creates what is called a "tree" by assigning the most frequently used character the lowest bit value instead of its 5 or 7 bit TT value. A "space" for example, typically would most always be a "0". Less frequently used characters would be assigned two, three or four bit values, depending inversely on how frequently they are used in the message. Therefore, again, what is transmitted is not native ASCII or Baudot, but a modified version. At least to the extent that character values are reassigned new bit values. So, how is a receiving station to discern how to decompress the ARSFI/Winlink strings back into legible text? The "tree TT" itself must be defined in the first frame or two of each message transmission. And, it must be precisely received for accurate decompression to be possible. Fading or multi-path propagation can easily distort or omit elements of the "tree TT" such that garble would be the result, were it not for Automatic Resend Request (ARQ) that is employed by ARSFI/Winlink and others among interlinked stations. ARQ repeats each string until precisely exactly what was sent is absolutely accurately received by the interlinked station. This is made possible through the use of a content checksum, or CRC, which must match actual received content. If the actual content received by the interlinked station does not match what the checksum predicts, it will result in resends until it does match. A monitoring, 3rd party receiver, however, has no ability to request resends if what it receives is incomplete or erroneous. Accurate monitoring is not an easy task.

Other methods of compression go further in that they assign shortened bit values to diphthongs (such as "oi", "th", etc.) or even to short, frequently used words such as "the," "and" and "or." Again, if they were to be used in the Amateur Service, they would deviate even further from defined TTs such as ASCII and Baudot, and would violate the intent and spirit of 47CFR§97.309(a) even more so than adjusting values for

perhaps a dozen characters and spaces.

In summary, compression amounts to a *redefining* of TTs such that fewer bit values need be transmitted, and over shorter time intervals. A considerable savings, *but only if it is applied to relatively large blocks of data.* Since the Huffman "tree TT" must be sent each time, as it is unique for each message, it is, for short messages, hardly worth the effort, as the extra bits needed for the TT to be transmitted reduce or almost eliminate any advantage gained from compression. And, most all ARSFI/Winlink messages are short. So, it begs the question, "why bother to compress?" (I suspect we can speculate as to why, even if there is little to no bit load economy: *to obscure content*) If, however, a fixed or "static" TT such as ASCII or Baudot were to be used, as 97.309(a) intends, only the message data need be sent and could be monitored in almost its entirety by 3rd party monitors without attempts at use of chancy, special software. Perhaps a few "holes" in received content, but not something almost totally garbled due to mistranslation.

5. Recent Software Developments

There have been claims made of the successful application of decompression software, called "LZHUF," to 3rd party-monitored ARSFI/Winlink content. One claim of complete success and one that was primarily garbled content.[6] The successful decompression resulted from accurately received content from close proximity stations. The unsuccessful attempt was the result of band conditions affecting a distant exchange and lost data.

Also, Dr. Peter Helfert of SCS-GmBH claims to have developed and is making available decompression software that can be added to PacTor modems of their manufacture that can decompress ARSFI/Winlink compressed content. He goes on to suggest use of

[6] Tests conducted by John Huggins, KX4O. See
https://ecfsapi.fcc.gov/file/1073182572879/KX4O_Demonstration_OTA_Winlink_Decoding.pdf
https://ecfsapi.fcc.gov/file/108140794324824/KX4O_Demonstration_OTA_Decoding_Addendum.pdf

Diversity Receiving techniques to assure accurate copy.[7] In so much as admitting that his software, like the LZHUF application, must obtain completely accurate content as a non-linked monitor, for results to be legible after decompression is applied.

Of course, this says nothing about the ability to decompress content via other digital techniques used by ARSFI/Winlink in their Internet email routing utility service, such as Winmor, ARDOP and VARA. And, the cost of obtaining SCS-GmBH PacTor modems just so that 3rd party monitoring can take place is a significant barrier. The approximate cost of the latest version is just under $2,000. Since PacTor 2, 3, and 4 technical characteristics are not completely released, or at least sufficiently for a competitive modem product to be developed, the only possible way to monitor PacTor transmissions without the use of $25,000 Signal Intelligence software is through the purchase of an SCS-GmBH modem.

6. A Possible Solution: Utilize a Static, Universal Translation Code

There is a solution that would only slightly compromise efficiencies gained through unique compression trees, yet would provide an improvement in efficiency since a unique TT would not be required as part of each message: *A standardized TT*. Since Huffman and others establish the frequency of character occurrence in each message, that step could be skipped if one were to analyze the frequency of character occurrence in English language word usage and develop a fixed, non-varying, standardized compression TT based on such a "public tree." Examining the frequency of character occurrence in a sample of 40,000 English words yields the following frequencies expressed in percent for the 10 most frequent alphabetic characters: E, T,A,O,I,N,S,R,H, and D, respectively: 12.02, 9.10, 8.12, 7.68, 7.31, 6.95, 6.28, 6.02, 5.92, and 4.32.[8] By summing the frequencies one can obtain the likelihood that words likely contain these

[7] Personal Email from Dr. Peter Helfert and QRZ.com Internet Blog discussion.
[8] http://pi.math.cornell.edu/~mec/2003-2004/cryptography/subs/frequencies.html

letters. The sum, or cumulative frequency, is 73.72, which means that at least one of these letters would be found 73.72 percent of the time in random English text. So, if a tree were to be defined using just these letters, four rows of bit values, consisting of 1 bit, 2 bits and 3 bits would be enough to define compressed, abbreviated values for the 10 most often used letters in the English language (ignoring spaces, punctuation and capitalization). Defining a TT that, like existing ASCII, Baudot and AMTOR, could be standardized and known to all beforehand, would permit universal adoption and ease of decompression. If the Commission were to agree, it could be added as yet another Specified Code for all to use to compress and recover content. Otherwise, the Commission should prohibit application of digital compression techniques of any kind on the HF amateur bands, since they produce unique and Unspecified codes each and every time they are utilized.

7. Summary

Contrary to what ARRL claims in its Ex Parte filing, the method used to compress content used by ARSFI/Winlink produces *effective encryption* of message body content for the following reasons:

a. The Huffman method produces a unique translation tree for each and every message body. What is generated by Huffman compression is not native ASCII, Baudot or AMTOR code, as is required by 47CFR§97.309(a), but modified tables of those standard codes. Unique TTs are generated for certain characters, very much like dynamic "keys" used to decrypt encoded transmissions.

b. Only an interlinked receiving station can ask for repeats or "ARQ" should the checksum of frame(s) indicate that content is erroneous. A monitoring station is helpless and must "make do" with what it receives.

c. If the Huffman tree data in the first one or two frames is not received by a third

party monitoring station exactly as sent, then the translation/decompression will yield gibberish. Whereas, if a standard code were to be resident beforehand in firmware for all to use, that would not be the result.

d. There have been claims of successful interception using augmented decompression software installed on SCS GmBH modems. Again, if exact content is received by a monitor, that may be possible. However, with the vagarities of HF propagation, Diversity Receiving techniques are likely necessary. An admission that content must be received exactly by a monitoring station to be legible. And, if no other way, through some complicated comparative technique from two or more monitoring stations in order to yield something other than gibberish.[9]

e. In order for the new ARRL/FCC Volunteer Monitor program to effectively monitor over the air ARSFI/Winlink content, it must be readable by widely used, inexpensive modems. To rely upon very expensive, sole-source modems produced by SCS-GmBH will only result in but a few who are capable of effective monitoring under ideal conditions. Some means must be made available to effect the use of inexpensive sound card modems and Windows-based operating systems to allow effective monitoring. And, either with no compression, or as part of such firmware, some means to decompress and monitor ARSFI/Winlink and other content.

f. Unless a standardized, static TT is approved as a Specified code, the Commission should prohibit digital compression on the HF amateur service bands since it effectively creates sets of unique, Unspecified codes each time a dynamic form of compression such as Huffman is utilized.

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[9] Id.

It is also critically important for the Commission to understand that the Internet email forwarding service provided by ARSFI/Winlink in and of itself operates in direct violation of Amateur Service regulations 47CFR§97.113(a)4 and 97.113(a)5. Emails from the public are automatically forwarded over amateur radio without inspection, review or control. Essentially, a no-fee competitor to identical common carrier services. For example, Ocens, Iridium, Inmarsat and Sailmail all operate fee-based commercial utility services for the purpose of sending and receiving Internet based emails anywhere in the world. ARSFI/Winlink is used by many to avoid paying usage and content fees for such services and clearly conflicts with the intended purpose of the Amateur Radio Service as a voluntary, non-commercial radio service as outlined in 47CFR§97.1(a). And, it has been used to send and receive commercial and other content under the likely assumption of privacy, created by the obscurity of transmitted content.

Again, I apologize for filing late in the proceeding, but had to do so in order to include relevant content in view of the ARRL Ex Parte filing.

Respectfully,

/s/

W. Lee McVey, PE Ret.
3 Squires Glenn Lane
Leeds, AL 35094-4564
September 24, 2019

Appendix: Email Letters of September 1 and September 9, 2019 to ARRL Board of Directors

APPENDIX

From: Lee McVey <lee.mcvey@xxxxxxx.net>
Sent: Sunday, September 1, 2019 10:25 PM

To: Rick Roderick K5UR <k5ur@aol.com>; w3tom@arrl.org <w3tom@arrl.org>; w9xa@arrl.org <w9xa@arrl.org>; K0BBC@arrl.org <K0BBC@arrl.org>; k5uz@arrl.org <k5uz@arrl.org>; WA8EFK@arrl.org <WA8EFK@arrl.org>; n2rj@arrl.net <n2rj@arrl.net>; k0das@arrl.org <k0das@arrl.org>; N5AUS@n5aus.com <N5AUS@n5aus.com>; w7vo@arrl.org <w7vo@arrl.org>; k6jat@arrl.org <k6jat@arrl.org>; w2ru@arrl.org <w2ru@arrl.org>; k0rm@arrl.org <k0rm@arrl.org>; N6Aa Richard J. Norton <n6aa@arrl.org>; Fred Hopengarten <hopengarten@post.harvard.edu>; Greg Sarratt <gsarratt@att.net>
Cc: Ron Kolarik <rkolarik@neb.rr.com>; Janis Carson <ab2ra@htva.net>; Ted Rappaport N9NB <tsrwvcomm@aol.com>; Dan White <hdwhite@charter.net>

Subject: Digital Compression Enhances Privacy

ARRL President and Directors:

There are many among you who proactively support the use of digital modes for handling message traffic. Message traffic has long been a service of Amateur Radio that has brought important information to and from emergency situations and disaster stricken locations. Especially to and from those with no other viable means of communication. In such situations, it has often been not only helpful, but crucial for 3rd parties to monitor traffic in the event propagation and noise levels prevent accurate information transfer. In other words, to get "fills."

Many digital modes are used today for message traffic. And, the Amateur Service has largely abandoned its habit of 3rd party monitoring since some popular modes are using forms of what is termed data compression that make legible monitoring difficult, if not impossible. The justification for the use of compression is that it reduces the total number of bits transmitted, thus improving throughput, all things being equal. The Winlink System uses a form of Huffman compression on the entire body of message information.

Huffman compression translates ASCII bit values from 7 bits per character down to as few as 2, for frequently used characters. This process is called "treeing," and the text selected to be compressed, can be only a word or two, (called frame compression) but Winlink chooses instead to compress the entire message body. What that process does is create a block of data bytes that are cryptic to someone trying to monitor. It is then sent in packets or frames of convoluted data until the entire body of the message is sent.

On the receiving end, a process called ARQ or "automatic resend request" is used such that if checksums of each packet or frame do not match, then a request to repeat transmission of the frame is generated. On successful retransmission and receipt, the receiving station discards the erroneous frame, and substitutes the correct one. Here is where the monitoring by a 3rd party falls apart. Extra bits introduced by an ARQ, or any missing bits will result in capture by a monitor of something that blows apart on decompression. The linked receiving station does not have that problem, because it ignores repeats and keeps up its ARQ routine until all checksums match. A monitor, of course, cannot do this.

There has been a lot of noise made recently about a successful monitoring of compressed Winlink traffic by a 3rd party monitor. Both examples, one by KX4Z and another by KX4O, were done under close proximity conditions where perfect copy was assured. None of the missing or extra bits that would likely be the case in real world HF. In fact, KX4O, who is an objective investigator, did attempt an intercept of a distant Winlink relay station data exchange and his results were mostly garbled data.

The best overall solution, I believe, is for compression to be eliminated. Winlink and some other traffic handlers may not be in favor of that because it "slows things down." Huffman, according to what I've read, ideally improves throughput by about 30%. If we had to pay by the second or by the byte transmitted, that might be a factor. But, as hams, the spectrum use is unmetered and free. Abuse of the widely accepted privacy enhancement brought about by compression of the whole message body has resulted in frequent and egregious abuse of Internet-connected email messaging. While I won't share the extent of the content here, suffice it to say that it is not complimentary to the Amateur Service to have been abused in the way it has under the assumption of "enhanced privacy;" and, would have serious consequences for us if news media outlets were to learn of the content and nature of the abuse. Perhaps not to the extent of the Janet Jackson TV "wardrobe failure," but rest-assured, there would be adverse public reaction, likely demanding changes none of us would welcome.

We are expected to self-monitor, as you all know, and the soon-to-be-operational Volunteer Monitor program will be an integral part of that expectation. However, unless VMs can openly copy what is being sent, then it will fail to be an effective deterrent for inappropriate use of the Amateur Service. A reduction in throughput of 30% is but a small price to pay for accountability.

Amateur radio needs to be an open port in a storm. Not something used to avoid for-fee commercial data pathways. If privacy is desired, it should not be expected on amateur spectrum. Any who desire it should go elsewhere.

Thank You and 73.

W. Lee McVey

W6EM

Leeds, AL

Monday, September 9, 2019, 07:56 AM CDT

From: Lee McVey (lee.mcvey@xxxxxxx.net)

To: w9xa@arrl.org; K0BBC@arrl.org; k5uz@arrl.org; WA8EFK@arrl.org; n2rj@arrl.net; k0das@arrl.org; N5AUS@n5aus.com; w7vo@arrl.org; w2ru@arrl.org; k0rm@arrl.org; w3tom@arrl.org; k6jat@arrl.org; k5ur@aol.com; gsarratt@att.net; k1vr@arrl.org; n6aa@arrl.org

Cc: kx4o@hamradio.me

Date: Monday, September 9, 2019, 07:56 AM CDT

Subject: Digital Compression: A Problem in Search of A Solution

VIA EMAIL

Dear ARRL President Roderick and Directors:

I wrote you on September 2 via email, explaining how Huffman Compression, as it is applied by ARSFI/Winlink, provides enhanced privacy unlike any other system in amateur radio. I believe it is important for you, as leaders, to understand this issue so you can create a “big picture” solution for amateur radio. One that fills the need for quick, straightforward copy of transmitted content.

I suspect you have been inundated with claims of “I’ve got a system” to after-the-fact decode/decompress Winlink messages from intercepted content into legible text. More to the point, I don’t think that after the fact data manipulation is or will be a practical approach to observing digital content across the amateur service. It just requires too much effort to accomplish very little. While I won’t speak to the validity of whether or not what was presented to you has actually worked, I would ask you to seek independent third parties who can objectively verify any such claims before you make any decision on accepting it as any part of a solution. Especially a decision whether or not to consider after the fact data manipulation as a satisfactory means to monitor transmitted content. I will say this yet again: What has recently been claimed appears to be successful only in non-fading conditions without ARQ or repeats. John Huggins, KX4O, as I told you in my earlier letter, recently tried to decompress an intercepted distant HF Winlink exchange, which yielded garbled text. This is likely because additional bits were received from re-transmissions, making accurate decoding by a monitoring station after the fact nearly impossible. And, I want to stress, this was after much time spent going over and over the received hexadecimal content. The situation with Winlink is unique in that all other data modes, techniques and systems in amateur radio, including proprietary AMBE signaling such as D-STAR, Fusion and DMR; and other digital techniques such as Pactor, AMTOR, and FT-8 are readily intercepted for meaning over the air by monitoring amateurs. We simply must have expedient, over-the-air, real-time-interception-capability to keep amateur radio transparent.

Huffman compression, or more accurately “translation,” was conceived to lessen the number of bits that need to be transmitted, shortening transmission time. The problem with Winlink is that it uses a sliding, “bulk message” Huffman technique which provides privacy between two parties, much like a ZIP file provides privacy until it is unzipped with the exact replica of the

transmission.

Huffman's approach first determines the most frequently used characters in the message block, and ranks them in order, based on their frequency of occurrence. It then replaces the 7-bit ASCII table value for those ranked characters with new values. The values selected are inversely proportional to character use. So, if an "E" were most frequent, it would likely be assigned a value of "00." Since the whole alphabet can be covered in 5 bits, a tree would look something like this: Two bits on top, followed by a row of three bits, then a row of four bits and so on. If the message is short, perhaps only a couple of rows would be needed to reassign unique new values to all characters used. As an example, a 25 word message might use 20 letters. So, three rows of 0's and 1's would be needed for the tree of reassigned values for each character, if capitalization and punctuation are ignored for simplification. It does save transmission time, since for 25 five character words without compression, this would amount to 125 characters and 875 bits. With Huffman coding, perhaps two thirds to one half as many bits, since all 7-bit ASCII characters would have new, shorter bit values assigned. Of course, the "key" to accurate decompression is to send along the Huffman "tree" so as to be able to expand the message back to readable ASCII text. The tree would likely amount to an additional load of about 40 bytes or 280 bits in the above example. As the situation currently exists, only Winlink's software can decompress transmitted content in real time, and for only the two stations that are linked.

So, in reality, Huffman tree translation creates something other than ASCII-defined code for transmission so as to improve efficiency. And, it repeats this unique code creation exercise, again and again, for each and every message sent through the Winlink system. And, this unique translated code for each character used in the message body violates the intent and spirit of FCC regulations. Part 97.309(a) requires that only *specific codes*, identified in subparagraphs (1), (2), and (3) as Baudot, AMTOR and ASCII are to be used on HF frequencies in the Amateur Service. So, why is Huffman compression attractive? In the commercial world, time is a cost factor, as is the transmitted bit load. Just look at your smart phone billing. So, it pays to use such a method to translate to a more efficient code model for long transmissions. Something that results in fewer bits being transmitted and still conveys the correct meaning. Of course, we don't have to pay for the use of our spectrum, and efficiency is important, but not at the expense of intelligibility. Perhaps even Samuel Morse recognized this when he assigned values to more frequently used letters such as "E," "T," "I," "A," "M," and "N" for the code.

The ever-changing code translation problem could be very easily rectified if Winlink adopted the standard approach of static Huffman coding used in other data modes in amateur radio; one that doesn't change the approach over and over and create an Enigma-scale decryption effort for each and every message. And, of course, if the Commission were to relax the requirements of 97.309(a), if needed, since whatever is done will shrink character bit values from what are now required to be full 7-bit length ASCII.

The best overall solution, as I said in my earlier letter, is for compression of entire message blocks to be abolished. But, in any case, the goal should be to achieve open, real-time monitoring capability. If compression were to be applied to only small bit packages, with error control coding (as is done in all other amateur radio data modes) this would result in satisfactory real-time intercept capability and not obscure meaning. Winlink and some other traffic handlers may not be in favor of this approach because they will claim that it will "slow things down." But, this slow-down is only about 20-30% and provides required compliance for openness and transparency. There are even some resident features available in SCS PacTor modems that permit compression and real-time, over the air copy of frame by frame content when observing

modems are placed in monitor or PMON mode. Winlink, for whatever reason, insists that such features be turned off.

From your meeting minutes and the ARRL Letter, you indicated that you did not consider the issue of open decodability of digital content in your recent Directors meeting. Since you are apparently revisiting bandwidth issues at this time, you should also understand that what I have presented here begs your immediate consideration as I hope it has shown that claims of "compression is wonderful" are just plain wrong. It is easy to see that it isn't so much efficiency that is desired, but instead the *effective encryption* gained through translation of ASCII characters into constantly varying translation tables of various values. It is that application that presents a problem. One that will undoubtedly end with Commission intervention, if it doesn't end soon.

We are expected to self-monitor, as you all know, and the soon-to-be-operational Volunteer Monitor program will be an integral part of that expectation. However, VM's cannot be the only ones privy to knowing what is sent over the air. To rely upon and insist that only VMs, alone, are to be the ones to intercept over the air traffic for meaning, fails to provide transparency. And, it continues to condone and set aside Winlink as a special case that promotes privacy and lack of openness on our airwaves. To rely solely on VMs for eavesdropping of any mode, let alone the contentious issues with Winlink, only perpetuates the problems that have caused ARRL to lose membership and credibility over the past 20 years, since the "Ad Hoc HF digital days" and RM-11306.

VMs, alone, being the ones to intercept over the air Winlink traffic, will fail to be an effective deterrent for inappropriate use of the Amateur Service. A minimal-consequence reduction in throughput is but *a small price to pay for accountability and transparency*. And, the ability of VMs and all of ham radio to use publicly available decoders to monitor digital content will provide an open, inviting culture that is much needed for the future of our hobby.

Amateur radio needs to be an open port in a storm. Not something used to avoid for-fee commercial data pathways. If privacy is desired, it should not be expected on amateur spectrum. Any who desire it should go elsewhere.

Please consider these items I've brought before you, and seek to create openness and transparency through the vetting of claims made by any data provider. One should ask why one part of our amateur community would be so against listening to peers and opening up their transmissions. The technology is done easily. Please take the lead in addressing this head on.

Sincerely,

W. Lee McVey, PE Ret.
W6EM
Leeds, AL